

THE RELATIONSHIP OF *NEIVAMYRMEX* *FUSCIPENNIS* TO *N. MACROPTERUS* (DORYLINAE: FORMICIDAE)

JULIAN F. WATKINS II

Department of Biology, Baylor University, Waco, Texas 76703

ABSTRACT. Male army ants from west Texas, southern New Mexico, and southeastern Arizona previously referred to as *Neivamyrmex fuscipennis* (Wheeler) are more closely related to *N. macropterus* Borgmeier than are specimens from east Texas. Although males of *N. macropterus* tend to have longer wings, less swollen postocular regions, and shorter distances between their lateral ocelli and compound eyes, the above two species are so closely related that none of these features will distinguish all specimens, especially those intermediate in geographical range. A more discrete measurement may be the division of the forewing length by the alitrunk length. A lectotype is designated for *N. fuscipennis*.

Army ant males from west Texas, southern New Mexico, and southeastern Arizona previously referred to as *Neivamyrmex fuscipennis* (Wheeler) by Schneirla (1971: 257) and Watkins (1972: 353) are more closely related to *N. macropterus* Borgmeier (1953) than are specimens from east Texas. Both species are known only from male castes, and the type localities given by Borgmeier (1955) are "Texas" for *N. fuscipennis* and "Lerdo, Durango, Mexico" for *N. macropterus*. Males of *N. macropterus* from the United States have previously been identified as *N. fuscipennis*. The key in Borgmeier (1955) includes both species, but is not adequate for separating all specimens. As Borgmeier had available to him only two specimens of *N. fuscipennis* (from the type series) and two of *N. macropterus* (holotype and paratype), he was not aware of the variations in their characteristics. The couplet for separating the above two species in Borgmeier (1955: 299) is translated as follows: "Lateral ocelli very close to eye margins; eyes large; wings long, slightly cloudy . . . *macropterus*; Lateral ocelli about one-half their diameters from margins of eyes; eyes small; wings shorter, more brown . . . *fuscipennis*."

After examining and measuring 53 males from 9 localities (Fig. 1; Tables 1, 2), I was able to find only one measurement which would distinguish all males of the above two species examined. While the

distances between the lateral ocelli and margins of the compound eyes were greater in all the species which I judged to be *N. fuscipennis* except one, the difference in these distances between many specimens of the two species could be detected only by careful, precise measurements. The heights of the compound eyes (*fuscipennis* 0.55–0.63 mm; *macropterus* 0.60–0.70), and lengths of the forewings (*fuscipennis* 8.4–9.3 mm; *macropterus* 9.0–9.9 mm) overlapped to the extent that several males could not be distinguished by these measurements. However, the forewing lengths of *N. macropterus* were relatively longer, therefore, when the forewing lengths were divided by the alitrunk lengths, the resulting figures were distinct for the two species (*fuscipennis* 2.50–2.71; *macropterus* 2.88–3.31). Dividing the forewing



Fig. 1. Distribution of *Neivamyrmex fuscipennis* and *N. macropterus*. x = *N. fuscipennis*; o = *N. macropterus*; ? = literature record of "*N. fuscipennis*," specimens not examined by present author.

lengths by total body lengths will not always yield discrete figures between the two species because the gasters may be extended or retracted. Coloration of the wings varied from hyaline to brownish for *N. macropterus*, and from brownish to blackish for *N. fuscipennis*, but most males could not be distinguished by wing coloration.

In addition to the characteristics used in the key couplet separating the two species, Borgmeier (1955: 646) stated that *N. macropterus* has a higher head, less swollen postocular region, and the end-branch of the cubital vein is straight in the wing of *N. fuscipennis*. While most specimens of *N. macropterus* examined in the present study had less swollen postocular regions, the distances from the border of the compound eyes to the posterior corners of the heads measured from a lateral view ranged from 0.08–0.18 mm for *N. macropterus* and from 0.13–0.20 mm for *N. fuscipennis*. The end branches of the cubital veins varied from straight to slightly curved in both species, and there were no significant differences in the heights or widths of the heads.

Borgmeier (1955: 645) in describing the *N. macropterus* male states: "Genitalia very similar to those of *fuscipennis*." I was unable to find any consistent differences in the genitalia of the specimens of the above two species which I examined.

TABLE 1
Measurements (mm) of males of *Neivamyrmex fuscipennis*

	Localities collected				Range for all localities
	USA, Texas*	USA, Texas	USA, Texas, Waco	USA, Texas, San Antonio	
No. males	7	9	2	1	
Body length	9.4–10.0	9.0–10.0	10.0–10.3	9.5	9.0–10.3
Alitrunk length	3.30–3.45	3.30–3.50	3.30–3.30	3.4	3.30–3.50
Forewing length	8.7–9.1	8.6–9.3	8.4–8.4	8.5	8.4–9.3
F-wing length/ alitr. length	2.52–2.69	2.56–2.71	2.55–2.55	2.50	2.50–2.71
Head width	1.40–1.50	1.45–1.50	1.40–1.50	1.50	1.40–1.50
Head height	.80–.90	.85–.90	.80–.85	.85	.85–.90
Cp. eye height	.55–.63	.58–.60	.58–.60	.60	.55–.63
Dst. cp. eye— head corner	.15–.20	.15–.20	.13–.18	.20	.13–.20
Diameter med. ocellus	.24–.28	.24–.28	.25–.25	.28	.24–.28
Dst. lat. ocellus to cp. eye	.08†–.15	.11–.15	.13–.15	.13	.08†–.15

* Type series.

† One specimen less than 0.10

TABLE 2
Measurements (mm) of males of *Neivamyrmex macropterus*

	Localities collected							Range for all localities
	USA, Texas, McKittrick Canyon	USA, Texas, Davis Mts.	USA, Texas, Big Bend Nat. Park	USA, New Mexico, Carlsbad	USA, Arizona, near Portal	Mexico, Chihuahua, Samalayuca	Mexico, Durango, Lerdo*	
No. males	10	1	3	2	15	2	1	
Body length	9.0-9.7	10.0	8.5-9.5	9.1-9.2	8.8-10.0	9.4-9.6	9.8	8.5-10.0
Alitrunk length	3.10-3.30	3.15	3.00-3.00	3.00-3.15	2.90-3.20	3.20-3.20	3.30	2.90-3.30
Forewing length	9.1-9.8	—	9.1-9.3	9.0-9.4	9.0-9.9	9.6-9.6	9.8	9.0-9.9
F-wing length/alitr. length	2.88-3.06	—	3.03-3.10	2.98-3.00	2.90-3.31	3.00-3.00	2.97	2.88-3.31
Head width	1.40-1.50	1.40	1.40-1.45	1.45-1.48	1.40-1.50	1.50-1.50	1.48	1.40-1.50
Head height	.80-.85	.85	.80-.85	.85-.85	.81-.85	.85-.85	.85	.80-.85
Cp. eye height	.60-.66	.65	.63-.64	.63-.68	.63-.70	.68-.68	.65	.60-.70
Dst. cp. eye—head corner	.13-.18	.11	.13-.13	.13-.13	.08-.15	.15-.18	.15	.08-.18
Diameter med. ocellus	.25-.30	.28	.28-.30	.28-.29	.28-.30	.28-.29	.29	.25-.30
Dst. lat. ocellus to cp. eye	.03-.08	.05	.05-.05	.05-.06	.05-.08	.05-.06	.08	.03-.08

* Holotype.

Although males of *N. macropterus* tend to have longer wings, shorter alitrunks, less swollen postocular regions, larger ocelli, and shorter distances between their lateral ocelli and compound eyes, none of these features will separate all males of this species from those of *N. fuscipennis*. A more useful measurement seemed to be the division of the forewing length by the alitrunk length. Also males of *N. macropterus* usually have a level, "shelf-like" area between the lateral ocellus and the compound eye, as compared to a more sloping area in *N. fuscipennis*. Body lengths, head heights, head widths, and wing colors are of little value in distinguishing the above two species.

Although I am at present retaining the *N. macropterus* name for the specimens from west Texas, southern New Mexico, southeastern Arizona, and northwestern Mexico (Fig. 1), I believe the reduction of *N. macropterus* to a subspecies of *N. fuscipennis* could be justified, especially because of the similarity of their genitalia. Perhaps the above problem can be more clarified when the queen and worker castes of the above forms are discovered.

The two forms seem to be geographically separated by the Prairie and Edwards Plateau Regions of west Texas. The *N. fuscipennis* males were collected along the Balconian Escarpment in eastern Texas while the *N. macropterus* specimens were collected from mountain ranges of west Texas, New Mexico, southeastern Arizona, and northwestern Mexico.

LECTOTYPE DESIGNATION (*Neivamyrmex fuscipennis*)

As previous descriptions of *Neivamyrmex fuscipennis* (Wheeler 1908; Smith 1942; Borgmeier 1955) have been based on specimens from the "type series" and no holotype has been designated, I have selected and labeled as a lectotype the specimen illustrated by M. R. Smith (1942). The pinned male has three labels on the same pin: upper (original), white paper, "Texas, Belfrage"; middle (added by M. R. Smith), yellow paper, "Fig. MRS"; and lower (added by Watkins), red cardboard, "*Neivamyrmex fuscipennis* (Wheeler), LECTOTYPE, Selected: 1972. By: J. F. Watkins." Lectotype data: adult male, body length 10.0 mm, forewing length 8.7 mm, alitrunk length 3.45 mm, head height 0.85 mm, head width 1.45 mm, distance from lateral ocelli to compound eyes 0.1 mm, locality: U.S.A., Texas, collected by Belfarge, deposited: U. S. National Museum, Washington, D. C. I have also labeled six additional males (two without gasters

and one without wings) from the same series ("Texas, Belfrage") as paralectotypes, and added determination labels.

Specimens for this study were provided by David R. Smith, Systematic Entomology Laboratory, U. S. Department of Agriculture, U. S. National Museum, Washington, D. C.; Vincent D. Roth, Southwestern Research Station, Portal, Arizona; Howard Topoff, American Museum of Natural History, New York; and by the author.

Financial support was provided by Baylor Graduate Faculty Research Grant 11-529.

LITERATURE CITED

BORGMEIER, T. 1953. Vorarbeiten zu einer Revision der neotropischen Wanderameisen. Stud. Entomol., Nr. 2: 1-55.

———. 1955. Die Wanderameisen der neotropischen Region (Hym. Formicidae). Stud. Entomol., Nr. 3: 1-716.

SCHNEIRLA, T. C. 1971. Army ants. A study in social organization. W. H. Freeman and Co., San Francisco. 349 pp.

SMITH, M. R. 1942. The legionary ants of the United States belonging to *Eciton* subgenus *Neivamyrmex* Borgmeier. Amer. Midl. Natur. 27: 537-590.

WATKINS, J. F., II. 1972. The taxonomy of *Neivamyrmex texanus*, n. sp., *N. nigrescens* and *N. californicus* (Formicidae: Dorylinae), with distribution map and keys to the species of *Neivamyrmex* of the United States. J. Kansas Entomol. Soc. 45(3): 347-372.

WHEELER, W. M. 1908. The ants of Texas, New Mexico, and Arizona. Bull. Amer. Mus. Nat. Hist. 24: 399-485.